

Amendments to the Claims:

1. (original) A method for operating a hybrid vehicle having a primary power generating system and a secondary power generating system coupled via a power transmission assembly for delivery of tractive force for the vehicle, the method comprising:

determining acceleration of input speed to the power transmission assembly when the primary power generating system is deactivated; and

inferring activation of the primary power generating system based at least in part on the acceleration of the power transmission assembly.

2. (currently amended) The method set forth in claim 1 wherein the primary power generating system comprises an internal combustion engine, the secondary power generating system comprises an electric machine that performs as a motor in one mode of operation, and performs as a generator in another mode of operation;

operating the hybrid vehicle comprises engine start detection and activation of the primary power generating system comprises engine start;

determining acceleration of input speed to the power transmission assembly comprises determining a transmission input speed, filtering the transmission input speed, determining a derivative of the filtered transmission input speed, and filtering the derivative of the filtered transmission input speed; and

inferring activation of the primary power generating system comprises

determining an engine speed and a transmission input torque;

generating a first trigger signal when the filtered derivative of the filtered transmission input speed is greater than a first predetermined ~~speed~~ acceleration for a first predetermined time;

generating a second trigger signal when the engine speed is greater than a second predetermined speed;

generating a third trigger signal when the transmission input torque is greater than a predetermined torque level; and

asserting an engine start signal when the first, second, and third trigger signals are substantially simultaneously generated.

3. (original) The method set forth in claim 2 wherein the transmission input speed is filtered using a first second order low pass filter and the derivative of the filtered transmission input speed is filtered using a second second order low pass filter.

4. (original) The method set forth in claim 2 further including the steps of:

determining an actual throttle position;

generating a fourth trigger signal when the derivative of the filtered transmission input speed is greater than a fourth predetermined speed;

generating a fifth trigger signal when the actual throttle position is greater than a predetermined position; and

asserting the engine start signal when the fourth and fifth trigger signals are substantially simultaneously generated.

5. (original) The method set forth in claim 2 further including the steps of:

filtering the engine speed;

determining a difference between the filtered engine speed and the filtered transmission input speed;

filtering the difference between the filtered engine speed and the filtered transmission input speed; and

asserting the engine start signal when the filtered difference between the filtered engine speed and the filtered transmission input speed is greater than a fourth predetermined speed.

6. (original) The method set forth in claim 5 wherein the engine speed is filtered using a third second order low pass filter and the difference between the filtered engine speed and the filtered transmission input speed is filtered using a first order low pass filter.

7. (original) The method set forth in claim 2 further including the steps of:

determining an engine clutch engagement; and
asserting the engine start signal when the engine clutch is engaged for a duration greater than a second predetermined time.

8. (withdrawn) The method set forth in claim 1 wherein the primary power generating system comprises an internal combustion engine, the secondary power generating system comprises an electric machine that performs as a motor in one mode of operation, and performs as a generator in another mode of operation;

operating the hybrid vehicle comprises engine start detection and activation of the primary power generating system comprises engine start;

determining a filtered acceleration of input speed to the power transmission assembly comprises

determining a transmission input speed;
filtering the transmission input speed using a Kalman low pass filter;
filtering the Kalman filtered transmission input speed using a first first order low pass filter; and

inferring activation of the primary power generating system comprises
determining a difference between the Kalman filtered transmission input speed and the first order filtered transmission input speed; and

asserting an engine start signal when the difference between the Kalman filtered transmission input speed and the first order filtered transmission input speed is greater than a first predetermined speed.

9. (withdrawn) The method set forth in claim 8 further including the step of exponentially adjusting a filter constant of the first order filter in response to time from initiation of the method.

10. (withdrawn) The method set forth in claim 8 wherein the difference between the Kalman filtered transmission input speed and the first order filtered transmission input speed is determined using a combiner.

11. (withdrawn) The method set forth in claim 8 further including the steps of:

determining engine speed;

filtering the engine speed;

filtering the transmission input speed using a first second order low pass filter;

determining a difference between the filtered engine speed and the second order filtered transmission input speed;

filtering the difference between the filtered engine speed and the second order filtered transmission input speed; and

asserting the engine start signal when the filtered difference between the filtered engine speed and the second order filtered transmission input speed is greater than a second predetermined speed.

12. (withdrawn) The method set forth in claim 11 wherein the engine speed is filtered using a second second order low pass filter, and the difference between the filtered engine speed and the second order filtered transmission input speed is filtered using a second first order low pass filter.

13. (withdrawn) The method set forth in claim 8 further including the steps of:

determining an engine clutch engagement; and

asserting the engine start signal when the engine clutch is engaged for a duration greater than a predetermined time.

14. (original) A powertrain system for operating a hybrid vehicle, the system comprising:

a primary power generating system;

a secondary power generating system coupled via a power transmission assembly for delivery of tractive force for the vehicle; and

a controller configured to determine acceleration of input speed to the power transmission assembly when the primary power generating system is deactivated, and infer activation of the primary power generating system based at least in part on the acceleration of the power transmission assembly.

15.-20. (canceled)

21. (new) A method for operating a hybrid vehicle having a primary power generating system and a secondary power generating system coupled via a power transmission assembly for delivery of tractive force for the vehicle, the method comprising:

determining acceleration of input speed to the power transmission assembly when the primary power generating system is deactivated; and

inferring activation of the primary power generating system based at least in part on the acceleration of the power transmission assembly,

wherein the primary power generating system comprises an internal combustion engine, the secondary power generating system comprises an electric machine that performs as a motor in one mode of operation, and performs as a generator in another mode of operation;

operating the hybrid vehicle comprises engine start detection and activation of the primary power generating system comprises engine start;

determining acceleration of input speed to the power transmission assembly comprises determining a first signal indicative of transmission input speed and determining a derivative of the first signal; and

inferring activation of the primary power generating system comprises

determining another signal indicative of the derivative of the first signal;

generating a first trigger signal when the other signal indicative of the derivative of the first signal is greater than a first predetermined acceleration for a first predetermined time; and

asserting an engine start signal when at least the first trigger signal is generated.

22. (new) The method set forth in claim 21 wherein the other signal indicative of the derivative of the first signal is the derivative of the first signal.

23. (new) The method set forth in claim 21 wherein determining the other signal indicative of the derivative of the first signal comprises filtering the derivative of the first signal.

24. (new) The method set forth in claim 21 wherein determining the first signal comprises determining a transmission input speed and filtering the transmission input speed.

25. (new) The method set forth in claim 24 wherein the other signal indicative of the derivative of the first signal is the derivative of the first signal.

26. (new) The method set forth in claim 24 wherein determining the other signal indicative of the derivative of the first signal comprises filtering the derivative of the first signal.